Impact of thermometry metrology on energy efficiency in heavy industry in Thailand project”

National Institute of Metrology (Thailand)

“I AM NIMT”

สถาบันมาตรวิทยาแห่งชาติ
National Institute of Metrology (Thailand)

Training: 3 times

1.1 Topic : How to use thermometer at high temperature properly in heavy industry

Place : Bangkok International Trade & Exhibition Centre, Bangkok, in THAILAND INDUST n 5 20 ci ar

1.2 Topic : How to use thermometer at high temperature properly in heavy industry

Place : Thai-German Institute, Chonburi on 2 to 3 April 2015

Number of participants : 20 participants

1.3 Topic : How to use thermometer at high temperature properly in heavy industry

Place : National Institute of Metrology (Thailand), Pathumthani

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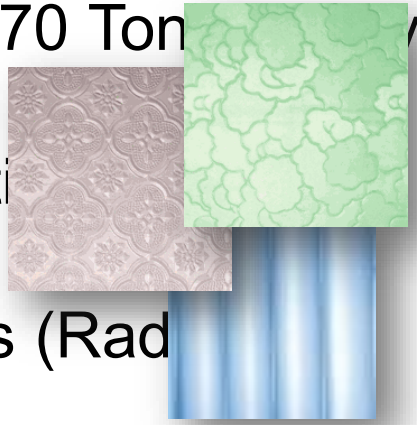
1.Glass Industrial

1.1 Factory #1 :

- Product : Plate glass and pattern glass (170 Ton y)
- Temperature range : 600 ^{o}C to 1 450 ^{o}C
- Thermometer : Thermocouple and Radiati Thermometer
- Calibration interval: 1 year (TC) / 5 years (Rad Thermometer)



1.2 Factory #2 :

- Product : Standard Glass Block and Decorative Glass Block (8 million pieces per year)
- Temperature range : 550 ^{o}C to 1 500 ^{o}C
- Thermometer : Thermocouple and Radiation Thermom
- Calibratio al :

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day)

- Temperature range : 500 °C to 1 500 °C
- Thermometer : Thermocouple and Radiation Thermometer
- Calibration interval: 1 year (TC) / 1-2 years (Radiation Thermometer)

1.4 Factory #4 :

- Product : Glass container, PET container and closure (150 Ton per day)
- Temperature range : 500 °C to 1 600 °C
- Thermometer : Thermocouple and Radiation Thermometer
- Calibration interval : 1 year

1.5 Factory #5 :

- Product : Glass and Lens (500 Ton per day)
- Temperature range : 550 °C to 1 500 °C
- Thermometer : Thermocouple and Radiation Thermometer
- Calibration interval : 5 years for radiation thermometer

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2.1 Factory #6 :

- Product : Cement (10 000 Tons p
- Temperature range : 300 °C to 1
- Thermometer : Thermocouple an
  Thermometer
- Calibration interval: 1 year (TC) / N.A. (Rad
  Thermometer)

2.2 Factory #7 :

- Product : Calibration service in industry application (25 Million Bath per year)
  (Thailand and South East Asia
- Temperature range : 0 °C to 1 100 °C
- Thermometer : Digital t r, Li r
  RTD and TC
- Calibration interval : 1 y
- Accreditation : ISO/IEC 17025

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3.1 Factory #8 :

- Product : Hot-rolled steel (2.4 Million Tons
- Temperature range : 500 ^{o}C to 1 300 ^{o}C
- Thermometer : Thermocouple and Radiatio Thermometer
- Calibration interval: 1 year

4. Auto part Industrial

4.1 Factory #9 :

- Product : Aluminum Wheel and Gravity Die Casting
- Temperature range : 300 ^{o}C to 400 ^{o}C
- Thermometer : Thermocouple and Radiation Thermometer
- Calibration interval: 1 year (TC)

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5. Steel Industrial

5.1 Factory #10 :

- Product : Ceramics sanitary ware (1 500 pie day)
- Temperature range : 300 ^{o}C to 1 100 ^{o}C
- Thermometer : Thermocouple and Radiatio Thermometer
- Calibration interval: 1 year (TC)

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Problem :

- Instrument using in production process doesn't calibrated
- Staff don't realized the traceability of the instrument using in the production process
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- Lo

Solution :

- Training staff about metrology
- Instrument using in production process must be calibrated or validated
- Using suitable instrument correctly for each production process
- Finding conditio uction process

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Pilot project for energy efficiency in frozen food industry

Attendance 2 companies

Company #1 : Ice-cream factory (SMEs)

Company #2 . Fresh, Frozen and Dried Vegetable and Fruit Exporter (United Kingdom, Middle East, Japan and Australia.)

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Problem :

- Staff can't realized tolerance limit of the instrument using in the production process
- Staff can't applied the results from the calibration certificate properly
- The setting of the freezing

Solution :

- Training staff in the required topics
- Measure the temperature of product and the air during freezing process
- Finding the optimum condition and temperature

Result :

- Staff can realized the tolerance limit of the instrument and can use the calibration results from the calibration certificate properly
- Company #1 can saving the energy in the freezing process for 21%
- Company #2 can saving the energy in the freezing process for 27%